White Paper

Now is the Time to Take the Cloud Seriously

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Oh – how things have changed!

It is hard to imagine the extent of change we have seen in the past twenty years. There is almost nothing we now do in our daily business lives that does not involve accessing and using the Internet. This ubiquitous tool is so tightly bound into our very existence that you have to stop and wonder how we used to do things.

It is worth taking a moment to understand just how far we have come before we take a look at the immediate and mid-term future to try to anticipate where we go from here.

Consider these facts[1]:

The Internet has only been in "commercial" use by the general public since early 1995. The growth has been breathtaking. In 1984, there were approximately 1,000 Internet devices in use around the world. This number had grown to roughly 1,000,000 by 1992, to a point during 2006 where 600,000,000 where in regular use – who bothers to count anymore?

One of the first companies to exploit this brand new route to market was eBay – founded just one year after the first public emergence of the web, it has now grown to a point where their revenues exceed $6 billion per annum. Can you imagine how long it would have taken to reach the customer base of eBay through older, more traditional mediums?

It is estimated that to reach an audience of 50 million people would have taken:

- 38 years using radio
- 13 years using television
- 4 years via the web

Consider also the humble text message. The ubiquitous mechanism used by us all to communicate instantly with our family, friends and colleagues. We take it for granted and yet SMS has been around for less than 20 years. The first commercial text message was sent at the end of 1992. Today the number of text messages sent exceeds the population of the planet – in a single day!

Do you ever stop to consider where you used to get answers to simple questions? Where did you go before the advent of the "humble" search engine, or more specifically before Google? Every month more than 2.7 billion searches are performed by Google alone – that's 2,700,000,000 every single month. Can you imagine?

The phenomenon of social networking will probably be with us forever. The instant success of these sites must have exceeded everyone's greatest expectations. For instance, did you know that Facebook has 175 million users? If it was a country, it would be the 6th biggest country in the world by population. 175 million is 2.5% of the world's population - all registered as users – one person in every 40 has a Facebook account! Consider the real percentage of Internet users that are registered, when you take into account all of the people that don't have Internet access, including young children and the older generation, it constitutes a huge percentage of the people who use the internet in their daily lives.

What is more astonishing, according to a statistic on the Facebook web site, is the fact that 'more than 3 billion minutes are spent on Facebook each day (worldwide)'!

With readily available access to almost all of us, we can all indulge our wildest dreams. It takes little effort or talent to become a published author – 3,000 new books are published every day. The music industry has completely changed through the ability to download music on demand.

The underlying infrastructure needed to support the advance of the web has been changing too. It is now possible to send 10 trillion bits of information per second down a single optical fiber! That equates to about 1,900 music CDs or 150 million simultaneous voice phone calls every second. It is estimated that this capacity will triple every 6 months.

Making long term predictions is almost impossible given how far we've come in the past 20 years. However, taking Moore's law[2] as a starting point it is estimated that by 2049, a $1,000 computer will have the computational power of the entire human race. But given the rate of change in the last 20 years, who would bet on it taking that long?

Amongst all this change is the difficulty it gives us in planning. Not just business planning, but social and educational planning as well. Our education system is preparing students to do jobs that do not yet exist. Business is evaluating technologies that will be obsolete before they are implemented. And we are trying to anticipate how we might solve problems that we don't know are problems yet.

It's tough.

A brave new world?

If all of the above is not enough to contend with, then consider the events of 2008. What has happened is unprecedented in modern times. The change the world has gone though and continues to go through, is what recessions are all about. Fast, inevitable and unavoidable. The restructuring of the world industries and economies is going to be immense. Seemingly stable and trusted institutions have disappeared overnight. It is not at all clear which direction organizations will be pushed in, but they do not have to be passive onlookers while these forces do their worst. They can be harnessed as an opportunity and for inspiration one need look no further than the words of the Sage of Omaha – Warren Buffet – for inspiration – "A simple rule dictates my buying: Be fearful when others are greedy, and be greedy when others are fearful. And most certainly, fear is now widespread, gripping even seasoned investors."

The need to change

To lead in this business environment is to embrace change. Your business operations must be both thorough and yet still quickly adaptable. It is no longer just what you do that counts, it is how you do what you do – and how quickly you can modify your methods to take on new opportunities and challenges, that is really important.

The perfect storm

Most of the world's economies are in recession and the credit crunch has steepened the slide. Policy makers around the world are racing to contain the damage and there are demands for the expansion of government spending, taxes and regulation. In some quarters, there are calls for a radical revision of current economic systems and the end of capitalism.

The current situation was created by a perfect storm of mutually reinforcing trends and policy mistakes: in the United States the loose monetary policy by the Federal Reserve post 9/11, the housing policy that encouraged home ownership by those less able to pay, the growth of leverage and the use of complicated derivatives, poor and lacking governance and an oil price shock. In the UK, Lord Turner, the chairman of the Financial Services Authority in the UK[3], said "The 'mistaken philosophy'– putting too much faith in banks and markets' ability to correct without a crash – had allowed a credit boom to grow

unchecked". All of these factors resulted in a housing bubble that became a recession.

To quote Albert Einstein "We can't solve today's problems using the same kind of thinking we used to create them."

Clearly it is time to apply different thinking – to change the way we do things and the place to start is with the tools that are at our disposal. As we have seen those tools are changing, and changing rapidly. The next wave of change is a seismic shift, a shift which will change forever how we use information technology. This shift is totally disruptive. This shift is called the Cloud. And that's why now is the time to take the Cloud seriously.

But what exactly do we mean by "The Cloud"?

The Cloud

The entire field of computing is fast becoming a "Cloud" – a collection of disembodied services accessible from anywhere and detached from the underlying hardware. As mentioned earlier, the Cloud has the potential to dramatically alter the way we buy and use IT services.

The Cloud and its potential!

The advent of Cloud computing is likely to have a greater impact on business use of IT, than the PC revolution did in the 1980s. The flexibility and potential cost savings of using applications accessed via the web will fuel adoption across the board.

With the average employee already using a variety of web-based applications independently of the corporate IT strategy, there is growing pressure on senior management to look at these new technologies to understand how they can be best used within the business environment. It is becoming increasingly difficult to sustain the fortress approach of keeping all IT within the confines of the corporate network. Corporate IT cannot continue to resist the wave of change that has so dramatically affected our everyday way of living.

But what, exactly, is the Cloud? Well let's ask it. A quick Google search returns a Wikipedia response of:

"Cloud computing is a computing paradigm shift where computing is moved away from personal computers or an individual application server to a "Cloud" of computers. Users of the Cloud only need to be concerned with the computing service being asked for, as the underlying details of how it is achieved are hidden. This method of distributed computing is done through pooling all computer resources together and being managed by software rather than a human."

In his new book, Dot Cloud[4]: The 21st Century Business Platform, Peter Fingar makes it even simpler to understand. He says: "The Cloud is the 'real internet' or what the internet was really meant to be in the first

place, and endless computer made up of networks of networks of computers. For geeks, Cloud Computing has been used to mean grid computing, utility computing, software as a service, virtualization, Internet-based applications, autonomic computing, peer-to-peer computing and remote processing—and various combinations of these terms. Process factories, anyone? For non-geeks, Cloud computing is simply a platform where individuals and companies use the internet to access endless hardware software and data resources for most of their computing needs, leaving the mess to third party suppliers."

There will be many ways in which the Cloud will change businesses and the economy, most of them hard to predict, but one theme is already emerging. Businesses are becoming more like the technology itself: more adaptable, more interwoven and more specialized. These developments may not be new, but the advent of Cloud computing will speed them up.

As Joseph Tobolski of Accenture[5] so rightly points out, that although the term Cloud computing is quite new, the concept has, like most of these things, been around for some time. We can look back onto timesharing and virtual machine concepts that were around in the late 1960s and early 70s. Sun talked extensively of "the network is the computer" as far back as 1982. There was also an attempt to deliver "applications on demand" (Application Service Providers) during the DOT COM boom.

What makes the Cloud real is the maturation of the Internet as a platform, reliable virtualization, commoditization and the introduction of various standards.

A recent analysis of Cloud computing in the Economist[6] stated that there are a plethora of data centers worldwide, with an estimated 7,000 data centers in America alone. Most of these data centers are one-off designs that have grown over the years. Many surveys show that these data centers are highly inefficient. According to a study by consultancy McKinsey and think-tank The Uptime Institute, on average only 6% of server capacity is used. Nearly 30% of servers are no longer in use at all and many organizations are unaware of which application is running on which server. What a waste and just think of the impact on the environment!

According to IDC, a quarter of corporate data centers in America have run out of space for more servers. For others, cooling has become a big constraint and often utility providers cannot supply the extra power required for an expansion. IDC believe that many data centers will have to be consolidated and overhauled. Hewlett-Packard used to have 85 data centers with 19,000 IT workers worldwide, but is expected to reduce this down to six facilities in America with just 8,000 employees by the end of this year, reducing its IT budget from 4% to 2% of revenue. HP is not alone and the perfect storm will speed up this trend as companies strive to become more efficient.

This Cloud of computing resources will not only effect the number of data centers and the number of people employed in them – it will have profound implications for the organization. On one level the

Cloud will be a huge collection of electronic services based on standards. Many web-based services are built to be integrated into existing business processes. IT systems will permit organizations to become more modular and flexible and this will lead to further specialization. In the Cloud, it will become even easier to outsource business processes, or at least those parts where companies do not enjoy a competitive advantage. This also means that organizations will rely more on services provided by others.

Furthermore, there will be not just one Cloud but a number of different Clouds: private ones and public ones, which themselves will divide into general-purpose and specialized Clouds. People are already using the term "InterCloud" to mean a federation of all kinds of Clouds, in the same way that the Internet is a network of networks. And all of those Clouds will be full of applications and services.

Cloud benefits

In many ways, the business benefits of the Cloud are so obvious that the revolution should have happened already! The high-risk strategy in the gathering recession is to batten down the hatches and do nothing. The lower risk strategy is to exploit the new Cloud capabilities to break the sclerosis of legacy, gaining process change flexibility and agility, and the ability to take out operational costs – all vital in managing a business through very challenging times.

If you were to carry out a search via Google of "Cloud computing benefits" you will get thousands of hits – a scan of the first couple of results pages will give you pretty much what you need – a set of benefits that cover more or less the following topics[7]:

- **Scalability:** IT departments that anticipate an enormous uptick in user load need not scramble to secure additional hardware and software. Instead, an organization can add and subtract capacity as its network load dictates. Better yet, because Cloud computing follows a utility model in which service costs are based on consumption, companies pay for only what they use
- **Easy Implementation**: Without the need to purchase hardware, software licenses or implementation services, a company can get its Cloud computing arrangement off the ground in record time - and for a fraction of the cost of an on-premise solution
- **Skilled Practitioners**: When a particular technology becomes popular, it's not uncommon for a whole slew of vendors to jump on the bandwagon. In the case of Cloud computing, however, vendors have typically been reputable enough to offer customers reliable service and large enough to deliver huge datacenters with endless amounts of storage and computing capacity
- **Frees Up Internal Resources**: By placing storage and server needs in the hands of an outsourcer, a company essentially shifts the burden placed on its in-house IT team to a third-party provider. The result: In-house IT departments can focus on business-critical tasks without having to incur additional costs in manpower and training

- **Quality of Service**: Network outages can send an IT department scrambling for answers. But in the case of Cloud computing, it is up to a company's selected vendor to offer 24/7 customer support and an immediate response to emergency situations

These are just a selection of those highlighted, all of which are relevant. However, the real benefits of Cloud computing go way beyond this list.

The advent and take up of the Cloud will have a profound effect on the way IT departments are accounted for. An increasing percentage of the expenditure will move to variable costs, as the industry changes from a buy-and-own model to a pay-as-you-go model. From capital expenditure to operational expenditure. This will help to drive down the overall costs of the organization and make IT much more akin to a utilities provider.

Furthermore, as we witness the inevitable drive to the Cloud, more business users will turn directly to on-demand Cloud solutions to satisfy the IT needs. As a result the IT dominance as the technology provider will reduce over time.

"During the past 15 years, a continuing trend toward IT industrialization has grown in popularity as IT services delivered via hardware, software and people are becoming repeatable and usable by a wide range of customers and service providers," highlights Daryl Plummer, managing vice president and Gartner Fellow. "This is due, in part to the commoditization and standardization of technologies, in part to virtualization and the rise of service-oriented software architectures, and most importantly, to the dramatic growth in popularity of the Internet."

Plummer continues by stating that taken together, these three major trends constitute the basis of a discontinuity that will create a new opportunity to shape the relationship between those who use IT services and those who sell them.

But what does that mean to the business and IT?

According to Russ Daniels, CTO Cloud Services at HP, "Something profound is occurring, something that will extend the reach of information technology to vast new markets, increase its value to existing ones and change the structure of the IT industry." He goes on to say in his blog[8] "Cloud services enable businesses to create richer, deeper relationships with customers, to treat each one as an individual, to customize offerings to meet the specific needs of each, and to integrate with the business partners to make this happen smoothly, and affordably". We might also add – on demand as part of well defined, compliant business processes.

So to answer the question – what does it mean? It means that it is all about business services delivered on demand to the right place, at the right time and at the right cost. There will be an ever diminishing requirement for business users to fund the purchase and deployment

of large enterprise applications – they will use specific services to do specific tasks as and when required.

Given that, as highlighted below, the key mechanism for delivering these services is process management techniques it is only a matter of time before, as Peter Fingar writes in Dot Cloud: The 21st Century Business Platform, "The forward-thinking CIO will no doubt put his or her head in the Clouds, and change his or her title to CPO, Chief Process Officer, for it's agile business processes that companies want to manage, not technology infrastructures."

What does this mean to the business?

The CXO-level messages become 'we break the sclerosis of legacy, so you can have more nimble systems in the face of major challenges that will require agility' and 'here is a route to taking out operational cost at a time when you know you need to get your cost base down.' Process control technology in the Cloud provides the key with which to unlock the status quo – and is the key to delivering.

Commodity services – the undercroft – en route to the Cloud

One set of the technology-enabled business services drawn on/required by this approach are data processing, data storage and network services.

Their standardization and commoditization does not, per se, make them creatures of the Cloud – but it does make them strong candidates for the Cloud. We already have a fairly rich world of both commodity and specialist infrastructure services platforms. BT's high capacity fiber network within the City of London is an example. The specialist platform supplied by Apple for the myriad of ventures innovating i-apps to feed the i-phone is another – as is the Salesforce.com apps platform (force.com and appexhange).

Let's not forget that there is also great nervousness in certain industries at the very idea of moving their 'highly secure data centre in the basement' out into the Cloud (assurance of business continuity, security, risk management, regulatory and legal compliance, etc.).

So the recognition at CXO level has to be that some of the benefits of commoditization and 'elasticity' can be harvested outside the Cloud, that much more can and will be in the Cloud, and that the journey into the Cloud can and will be made business-safe. The ability to de-couple decisions about how a business sources its infrastructural 'undercroft' from decisions on how it manages its front end processes is key here.

What is a Cloud application?

A Cloud application leverages the Cloud in software architecture, often eliminating the need to install and run the application on the customer's own computer, thus alleviating the burden of software maintenance, ongoing operation and support. Here are some characteristics and ways to tell if an application is in the Cloud[9]:

- If you need to send a 40 page requirements document to the vendor then it's not Cloud
- If you can't buy it on your personal credit card... it's not a Cloud
- If they are trying to sell you hardware... it's not a Cloud
- If there is no API... it's not a Cloud
- If you need to re-architect your systems for it... It's not a Cloud
- If it takes more than ten minutes to provision... it's not a Cloud
- If you can't de-provision in less than ten minutes... it's not a Cloud
- If you know where the machines are... it's not a Cloud
- If there is a consultant in the room... it's not a Cloud
- If you need to specify the number of machines you want upfront... it's not a Cloud
- If it only runs one operating system... it's not a Cloud
- If you can't connect to it from your own machine... it's not a Cloud
- If you need to install software to use it... it's not a Cloud
- If you own all the hardware... it's not a Cloud

How do I make the Cloud deliver on its promise?

As already discussed, there isn't just one Cloud but a number of different sorts: private Clouds and public Clouds, which themselves will divide into general-purpose and specialized ones, and all of those Clouds will be full of pre-defined and readily available services. Accessing and provisioning these services is a very different proposition from what we think of as applications today. Therefore, it represents a very different opportunity; it is a mechanism whereby a user can put together an "application" based around normal working patterns, using readily available services.

Using the Cloud, means that it is possible to handle any sort of business problem usually tackled by enterprise solutions, by leveraging the capability to associate virtually any number of web services within the context of an application. Service Provisioning is effectively an application generator within a process and is inherently more flexible, easier to provide, easier to manage and easier to use than traditional "ERP" type products.

It is all driven and controlled by well defined processes and process management techniques that utilize a Business Operations Platform, capable of orchestrating and provisioning services and resources on demand at exactly the right place at the right cost. Making the Cloud work for you is all about control, change and speed.

Being able to invest more in "new developments" and innovation to increase business agility and efficiency are top priorities for most progressive CXOs.

Introducing the Enterprise Cloud Orchestration System to create Cloud applications

The advent of the Cloud and the flexibility and cost saving associated with it has resulted in the need for a new approach to managing business processes and the delivery of shared services has emerged. The term Enterprise Cloud Orchestration System[10] (ECOSystem) is used to describe the extended capabilities of The Cordys Business Operations Platform (BOP) in the Cloud. The Cordys ECOSystem, which itself is a Platform as a Service, fulfills six main roles:

- Places existing and new application software under the direct control of business managers
- Facilitates communication between business and IT
- Makes it easier for the business to use existing services and create new ones
- Enables the automation of processes across the entire organization, and beyond it
- Gives managers real-time information on the performance of processes
- Allows organizations to take full advantage of new business services on demand

Organizations that understand the benefits that the Cloud will deliver, have realized that in order to enable their business to be more responsive to change, that they have to create a process layer, which decouples the processes from the control of applications. In the same way that middleware provided a data abstraction layer, Cordys ECOSystem provides a "process abstraction" layer that delivers business services when and where they are needed.

Before this approach was available, enterprise applications typically would be in charge of their localized sets of processes, with the subjugation of adjacent applications to these processes. With every application handling this process differently, clearly this would not be, and is not, a workable solution in the Cloud.

With Cordys ECOSystem, the control of processes is externalized away from individual applications. It makes them equal peers, subjugated to the ECOSystem layer that controls the execution of the processes, the provision of services and the delegation of tasks or activities to the individual applications according to their specific uses and needs.

In order to do this effectively, the PaaS (Platform-as-a-Service) must be able to do the following:

- Manage applications in parallel as well as in series
- Manage people-intensive applications
- Decouple the process from the application
- Work both inside and outside the organization
- Be both continuous and discrete, and allow processes to change over time
- Put the process into the hands of the business user

This is a tall order. The Cordys ECOSystem delivers against these needs unlike other PaaS solutions, providing a new way of delivering the agility and flexibility needed to support today's rapidly changing business environment and the challenges posed by globalization.

Simply put, the Cordys ECOSystem is designed to help businesses deploy, execute, measure, manage and optimize their processes in the Cloud. Properly implemented, Cordys ECOSystem helps organizations to pin-point and resolve process bottlenecks, monitor and anticipate business activity and quickly react to the constantly changing business environment. Many industry analysts recognize this approach as one of the most important software technologies needed for deploying effective Cloud solutions.

There are two clear reasons for needing process technology to underpin the provision of applications in the Cloud:

1. Rapid Innovation – Ra-In[11] Clouds

As we have seen, the Cloud is the ideal mechanism for utilizing extensive computing power – be that storage or specific applications such as Salesforce.com. As it stands it saves you money. It doesn't help you innovate and it doesn't help you execute business applications. The Cloud does not enable you to simply build applications to meet the needs. Process technology, in its broadest sense, lets you do this in an easy and flexible way – the processes orchestrate the interaction and integration of services

2. Compliance

Cloud deployments can be very disruptive and lead to anarchy and a breakdown of corporate governance and compliance. Think of the myriad of Excel spreadsheets – Situational Applications – that are used to run most businesses – no control, no compliance, no ownership. Process enablement of these types of applications will provide ownership, control and auditability – making them compliant with the corporate demands without stifling innovation and change

New approach, new opportunities

The advent of the Cloud means that the focus has moved up from the infrastructure implementations to mechanisms that access the capabilities provided. This means that the ultimate measure of success will be how the services are consumed and whether that leads to new business opportunities.

One such business opportunity might be what Cordys term CloudSourcing[12]. With CloudSourcing, business users can mix and match existing premised-based processes run on applications like SAP, Oracle, IBM Websphere, MS .Net or even early legacies with processes designed entirely on the Cloud. So no need for the translation of business needs into a complex requirement specification document.

In his paper on CloudSourcing, Mark de Simone says "As a business user, you can use CloudSourcing right away! No need to wait. If you have the administrative access to do it, then you can. You can now

look at the Cloud as a "Self Service" for continuous productivity improvement. And there is no visible difference whether the process you are designing and using is consuming data and logic which is resident inside the enterprise Cloud or coming from an external Cloud with a dedicated enterprise tenancy."

Not only this, but capital expenditure is reduced down to negligible and operational expenditure, only existing as a result of a revenue stream.

In an attempt to dramatize and focus thinking on the very substantial challenges (and thus opportunities) that CloudSourcing gives us, we need to consider the four game changing developments: Consumerization, commoditization, virtualization and globalization[13].

- Consumerization of the capabilities of IT has been lead by the likes of Amazon and Google. From the start they have created service infrastructures (data processing, data storage, network integration) designed around the principle of 'one to many' and able to handle very high transactional loads reliably, securely and at very low unit cost
- In so doing they have extended commoditization of the capabilities of IT from its original home in telecoms – and given a lead to companies such as Salesforce.com who, capturing the key aspects of CRM in powerful software, delivers an on-demand CRM service 'offer' over the Net that is self-configurable and highly competitive cost wise
- Virtualization, the emergence of 'new generation' technical architectures (SOA, 'Over IP', Web 2.0, etc.) whose chief aspect is to enable delivery of 'loosely coupled IT' in the place of the tightly coupled architectures that have dominated the scene hitherto fore
- Globalization has taken on new meaning this decade, with the impact of the BRICs economies, their spawning of new globally competitive players and an increasingly global 'market for talent' – but perhaps even more importantly with the rapid development of the Web (enabled further by the broadband revolution) as a global services-delivery highway

Conclusion

In this paper, we have examined the dramatic transformation of the business landscape not only over the past year, but over the decades since we saw the birth of now ubiquitous technologies.

The PC revolution, the Internet, Web 2.0 and the simple text message are now taken for granted, so much so that there are generations of school children who will only ever see a fax in a museum. The rise of the Cloud arguably could consign the corporate data center to the same fate.

The Cloud will help businesses become more responsive to change, of that there is no doubt. But at its heart lies the process layer and that is where Cordys ECOSystem will revolutionize the way business services are delivered and how.

What is certain though is that those organizations, which do not embrace change, now are facing almost certain extinction. Business has to embrace change. That means the underlying business processes and operations must be both thorough and yet still quickly adaptable.

So it's no longer just what you do that counts, it's how you do what you do – and how quickly you can modify your methods to take on new opportunities and challenges that's really important.

Organizations need to transform themselves into agile operations capable of turning a constantly changing business environment into solid business opportunities. Innovation and speed of change are the key opportunities for competitive differentiation moving forwards.

On one level, the Cloud will be a huge collection of electronic services based on standards. Many web-based services are built to be integrated into existing business processes. IT systems will permit organizations to become more modular and flexible and this will lead to further specialization.

In the Cloud it will become even easier to outsource business processes, or at least those parts of them where firms do not enjoy a competitive advantage. One thing is certain in this world we now live in of dramatic change: it will only continue. For organizations the question therefore is how to embrace this to win, or ignore at their peril.

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For further information about Cordys, visit www.cordys.com

Cordys is a global provider of software for business process innovation and Enterprise Cloud Orchestration. The industry-leading Cordys Business Operations Platform (BOP) consists of a complete suite for next generation Business Process Management (BPM), Business Activity Monitoring (BAM) and innovative SaaS Deployment Frameworks (SDF), delivering a complete Platform as a Service (PaaS) solution. It includes an open, integrated set of tools & technologies including Composite Application Framework (CAF), Master Data Management (MDM) and aSOA Grid. The Cordys platform and its cutting-edge Cloud technology empowers customers to dramatically improve the speed of change, fundamentally altering the way they innovate their Business Operations to achieve a true customer-centric philosophy. Global 2000 companies worldwide have selected Cordys to achieve business performance improvements such as increased productivity, reduced time to market, higher security and faster response to ever-changing market demands.

Rapid solutions to streamline your business processes

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